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U.S. DEPARTMENT OF AGRICULTURE, MISCELLANEOUS PUBLICATION NO. 25.

A CALENDAR OF LIVESTOCK PARASITES

A ZOOLOGICAL ZODIAC

PARASITES DIFFER IN THE TIMES WHEN THEY DO MOST DAMAGE AND WHEN THEY ARE BEST CONTROLLED. THIS CALENDAR TELLS WHEN AND HOW TO COMBAT THESE PESTS.

A CAREFUL CONSIDERATION of this parasite-control calendar may save you time and money, may help to save your livestock, and may even save your life. It gives timely warnings as to seasonal troubles from parasites and suggests ways and means of avoiding or controlling them. More detailed information may be obtained, on request, from the United States Department of Agriculture.

The year-round suggestions at the end of this publication should be kept in mind as practical measures for preventing losses and increasing your income from livestock.

The time arrangement in this calendar is based on conditions in the East, Middle West, North, and in the Rocky Mountain region of the United States. It is not so definitely applicable to conditions in the South, Southwest, and the Pacific coast. However, the control measures noted are generally applicable, and more precise information will be found in the various publications mentioned here.

Washington, D. C. Issued June, 1928

A CALENDAR OF LIVESTOCK PARASITES

By MAURICE C. HALL, *Chief, Zoological Division, Bureau of Animal Industry*

JANUARY

Look for ear ticks and treat infested animals.
Examine livestock for lice and mange mites.
Make plans for taking good care of the young stock soon to be born.

Animals badly infested with ear ticks (fig. 1) are likely to die late in the winter or early in the spring. If your stock is infested, clean out their ears of ticks now with a mixture of 2 parts pine tar and 1 part cottonseed oil. Write for Farmers' Bulletin No. 980 (*14*).[1]

At this season of the year livestock in temperate climates have a respite from parasitic worms to a certain extent, as freezing weather has an unfavorable effect on the development of the worm eggs and the young worms on the pasture. The parasites which are troublesome at this season include lice and mange mites. These should have been taken care of last fall by dipping.

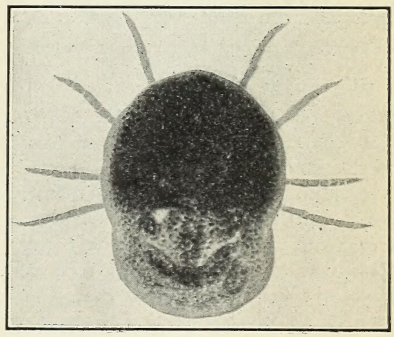

FIG. 1.—Spinose ear tick, enlarged

The worm parasites will open their spring drive on livestock at the time when warm weather and the livestock babies make their appearance. These babies will be the special victims of the parasites. Plan now to put the young livestock on safe areas and to give them special attention.

[1] Italic figures in parentheses refer to literature cited, p. 14

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FEBRUARY

Look for signs of warbles on cattle and destroy the grubs. Get your neighbors to do the same.

A concerted drive on this pest is necessary to eradicate ox warbles from a locality.

Examine cattle for evidence of ox warbles in the form of lumps on the skin, especially along the back. If you find these, squeeze them out (fig. 2) and destroy them. Do not crush the warble, as this gives rise in rare instances to bad effects on the cattle, although most animals recover rather rapidly. Grubs may also be destroyed by the use of the drug, Derris, as a wash, ointment, or powder, by pyrethrum ointment, by the injection of benzol or carbon tetrachloride, or by the application of fine tobacco powder or nicotine dust. Get your neighbors to cooperate by destroying warbles in their herds, so that the warbles on their places will not reinfest your cattle. In some places in the South ox warbles may begin to emerge early in December, and in parts of the Southwest in August, the time varying with the latitude and other factors. Write to the Department of Agriculture for information and advice.

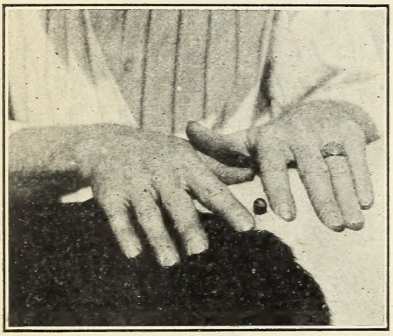

FIG. 2.—Extracting a warble from a cow's back

In many cases the methods of slaughtering on the farm and at small country slaughterhouses are such as to favor the spread of parasites. Offal is thrown out and allowed to decompose in an offensive manner. Dogs eat this material, and as parts of carcasses infested with tapeworm cysts are rejected as offal, this procedure permits dogs to become infested with tapeworms which they in turn carry to livestock and infest them with the bladder worms. Among the tapeworms spread in this manner is the deadly hydatid which forms a cyst the size of an orange or larger in cattle, sheep, and swine, and in man. Its adult tapeworm stage is a tapeworm less than half an inch long in dogs. The intestines in offal often contain vast numbers of eggs of worm parasites. The offal is also a prolific source of blowflies which breed in great numbers in it. This offal should be tanked or treated in such a way as to kill any parasite material it may contain, and disposed of in a way which prevents its becoming a public nuisance and a source of annoyance and danger.

MARCH

Plan to raise young pigs free from roundworms by following the system of swine sanitation.

Clean up places that later may breed flies.

In the South help eradicate cattle ticks by dipping regularly.

In your spring farrowing operations, follow the system of swine sanitation developed by the Bureau of Animal Industry. This will enable you to avoid large losses from such parasites as roundworms (ascarids) (fig. 3) and from kindred conditions associated with dirty hog lots, such as bullnose and similar troubles. It will not prevent losses from bad breeding, bad feeding, bad management, bad judgment, chilling, accidents, and similar causes; you will have to prevent these by appropriate measures. However, the system of sanitation has paid big returns to the men who have used it. It will pay you. Write to the Department of Agriculture for Leaflet No. 5 (*18*).

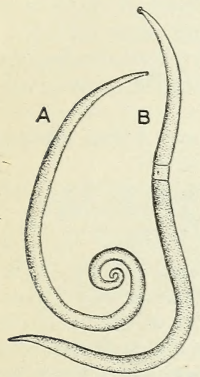

FIG. 3.—The roundworm of swine: *A*, Male; *B*, female. Reduced.

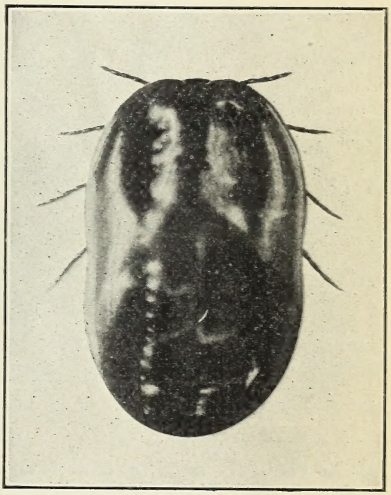

FIG. 4.—Texas-fever tick, engorged female, enlarged

Don't leave your scattered straw stacks to breed stable flies. Plow straw under or burn it. Write for Farmers' Bulletin No. 1097 (*3*). Scatter manure on fields to prevent fly breeding. Write for Farmers' Bulletin No. 1408 (*10*).

Dip that tick. The cattle or fever tick (fig. 4) transmits Texas fever, reduces beef and milk production, makes costly and annoying quarantine necessary, and ticky cattle sell for one-half cent to 2 cents per pound less than tickless cattle. Southern cattle owners in areas quarantined for the fever tick should begin now and by dipping every 14 days until November eradicate this pest. In regions where the blue bug or fowl tick occurs, spray henhouses, and especially the nests, with anthracene oil. (See Farmers' Bulletin No. 1070 (*2*).)

APRIL

Remember that adult animals harbor various parasites and may show little evidence of them; but such pests soon spread to young stock, causing heavy losses.

Put young animals on clean, safe pastures.

Keep young chicks away from turkeys and areas occupied by turkeys if you want to avoid losses by gapes, as turkeys commonly harbor gapeworms (fig. 5) even though they show no signs of gapes. Adult and young turkeys may carry gapeworms without evident bad effects in many cases, and hence serve as carriers, but adult chickens are practically immune and can not serve as carriers. Chicks are highly susceptible to gapeworm infection as a rule, acquiring the infection from turkeys; the worms are deadly to chicks. Write for Farmers' Bulletin No. 1337 (7).

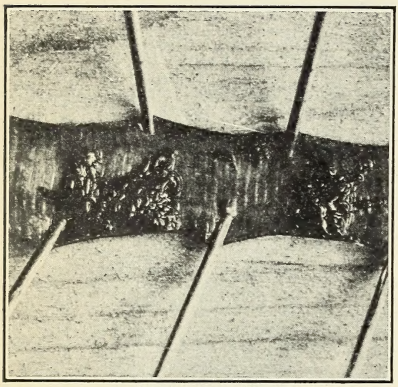

FIG. 5.—Inside of windpipe of chicken, showing masses of gapeworms

If birds are lousy, treat sitting hens before chicks hatch.

Early hatching helps to diminish losses from parasites.

Put all young livestock—lambs, calves, colts, etc.—on clean, safe, well-drained pastures away from older animals other than the mothers and away from areas occupied by older animals during the past year or which have not been sown to a fresh crop since so occupied. The older animals usually harbor worms and may show little evidence of the fact, but young animals are highly susceptible to worm infections and to the bad effects from them. The infective material (worm eggs and young worms) passes in the manure on to the pasture, and hence contaminated pastures are dangerous to young animals.

If you allow your dog or cat to play with your child, keep the animal as free from worms as you keep the child. Certain dog and cat tapeworms, in association with fleas and biting lice, are communicable to man and are most commonly found in children who associate with dogs and cats. Certain roundworms of dogs and cats are sometimes found in man, usually in children. Your veterinarian can tell you whether your dog or cat has worms.

MAY

Prevent the screw-worm fly from breeding.
Treat sheep and lambs for stomach worms.
Avoid overstocking of pastures.

The screw-worm fly usually appears during May in areas where it is troublesome. To prevent its breeding, burn all carcasses or bury them deep. Treat all brands, shear cuts, and wounds to save your stock from screw worms. (Fig. 6.) Write for Farmers' Bulletin No. 857 (*5*).

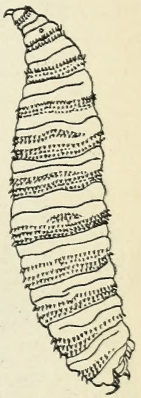

FIG. 6.—Screw worm, enlarged

Begin to treat your sheep and lambs for stomach worms and other worm parasites, and keep this up at three-week intervals until freezing weather. On heavily stocked, short, dense southern pastures it may be necessary to treat every two weeks. The copper sulphate solution is satisfactory for stomach worms. If hookworms and tapeworms are present, use the copper sulphate and tobacco solution.

It is advisable to employ a competent veterinarian to treat your animals, as proper diagnosis and treatment call for knowledge and skill to avoid errors, loss of time, and waste of money. Sheep and lambs kept under proper treatment do not die of worms; they make a better growth, and they produce more wool and mutton.

FIG. 7.—Grub in the head, which affects sheep; about natural size

Tar the sheeps' noses with pine tar during the fly season to prevent infection with grub in the head. (Fig. 7.) Sheep suffer more from parasitic diseases than from any other diseases, and the sheepman loses a lot of money on account of these parasites. Write for Farmers' Bulletin No. 1330 (*8*).

Be sure to avoid overstocking, especially on short, dense pastures. Rotate your livestock and pastures whenever possible. Three weeks after young stomach worms have been swallowed by sheep, these worms are producing eggs which pass in the manure and either start a pasture infection or increase an infection already existing.

Provide clean, safe drinking water for your stock. Such parasitic worms as liver flukes may be conveyed to stock in drinking water from small streams, ponds, and puddles. Low, wet areas should be drained or filled in. Wet pastures are especially dangerous for young livestock, and if stock must be run on such areas it is advisable to put mature stock on them and to put the young stock on high, dry, hillside pastures.

JUNE

If animals are unthrifty without apparent cause, parasites may be responsible.

Hold a post-mortem and find the cause.

Then learn how to prevent the trouble in other animals.

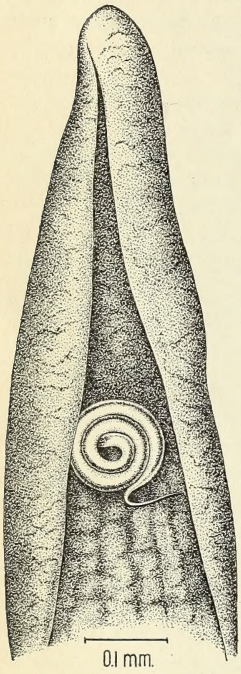

FIG. 8.—Young stomach worm coiled on grass blade waiting for a grazing sheep to eat the grass and thus become infested with stomach worms. Greatly enlarged

Remember that an unthrifty animal, especially a young one, may be full of parasites. Parasites are insidious in their attack and will rob you in a quiet way without warning. They rarely cause quick death, but the parasitized animal is unthrifty and in time becomes emaciated and dies.

Don't say, "Well, this animal never amounted to anything, it never did well, and it never would have done well." It can't do well with thousands of worms sapping its vitality. Investigate every animal's death to determine the cause; there's always a reason.

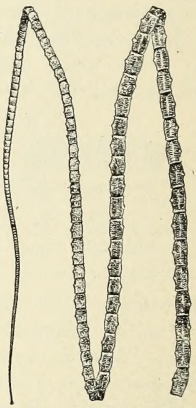

FIG. 9.—Gid tapeworm, about one-half actual size. When the eggs of this dog tapeworm are eaten by sheep, the sheep develop a fatal disease of the brain

Take such cases in hand early. Call in a competent veterinarian and, if necessary, kill one of the worst animals and have him examine it thoroughly. Watch for the pale skin and pale linings of the mouth and eyelids, which are the signs that worms (fig. 8) are sucking blood from the sheep. Consult Farmers' Bulletin No. 1330 (*8*).

Depluming scabies is likely to make its appearance in poultry flocks in spring. Directions for its control are given in Farmers' Bulletins No. 1337 (*7*) and No. 801 (*6*).

If large roundworms are found in the small intestine of a killed fowl, tobacco dust should be used in the mash fed to the flock. If the fowls have tapeworms, use the kamala treatment. The dose is 1 gram for chickens and 2 grams for turkeys. It is advisable to call in your veterinarian when disease is present and treatment is necessary. If chicken mites (fig. 11) are present, spray the houses, roosts, and other possible hiding places with a heavy anthracene oil. If the birds are lousy, use the sodium fluoride treatment. Consult Farmers' Bulletins No. 1337 (*7*) and No. 801 (*6*).

JULY

Observe animals for signs of lungworms.
Treat fowls for worms and lice.
Spray poultry houses to kill the mites.
Note condition of your dogs.

Parasite trouble begins to be serious in July or August, if proper precautions have not been taken. Watch for them, and if your animals "don't do well," suspect parasites of being the cause. It is probably due to poor breeding, poor feeding, or parasites, and if you are sure it isn't the first two it is probably the last. If your sheep, calves, or pigs have a husky cough, look out for lungworms.

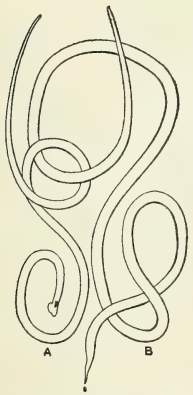

FIG. 10.—Cattle lungworm: *A*, Male; *B*, female. Enlarged

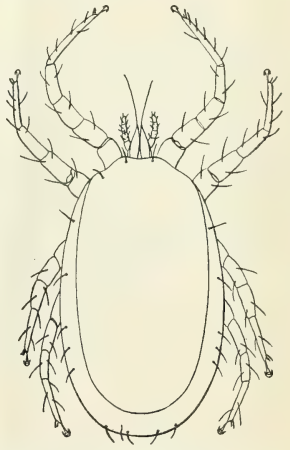

FIG. 11.—Chicken mite, greatly enlarged

(Fig. 10.) Infested animals should be isolated and given nursing treatment. Consult Farmers' Bulletin No. 1330 (*8*).

Unthrifty dogs, especially pups, may be wormy. Pale linings of the mouth and eyelids are an indication of hookworms. Dogs with tapeworms may be a menace to you and your livestock. Take your sick dog to a competent veterinarian for treatment. Write for Department Circular No. 338 (*9*).

The best protection against worms and coccidiosis in young animals is obtained by the greatest possible cleanliness and sanitation, the raising of young stock on clean areas or in clean buildings away from older animals and areas used by them, and by sound feeding procedures. Good results are reported in connection with coccidiosis in chicks from the use of a mash containing 40 per cent dry skim milk. High vitality is an aid in protecting animals against many parasites and good feeding practice builds up an animal's condition. Vitamins appear to be of value in protecting animals against certain worm infestations, and the feeds should contain these essential substances.

AUGUST

Look for signs of liver flukes.
Dip sheep to kill ticks.
Control fleas on household pets.

Along the Gulf and Pacific coasts and the adjoining basins of their tributary rivers, look out for evidence of liver flukes in sheep and calves. The animals may improve and become fatter in the first stages, but later they will begin to get thin and show a persistent diarrhea. On post-mortem the liver will be found to be soft, easily broken up, and full of flukes, which are flat, leaflike worms (fig. 12) an inch or so long. Call in your veterinarian and have him treat the animals with small doses of carbon tetrachloride. Consult Farmers' Bulletin No. 1330 (*8*).

FIG. 12.—The common liver fluke, natural size

FIG. 13.—The sheep tick, enlarged. This is not a true tick

FIG. 14.—The dog flea, enlarged

This is a good time to dip your sheep for sheep ticks. (Fig. 13.) Write for Farmers' Bulletin No. 798 (*12*).

Is your house full of fleas? (Fig. 14.) They are probably presents from your dog or cat. Write for Farmers' Bulletin No. 897 (*1*), or Department Circular No. 338 (*9*).

Southern cattle may show ox warbles in the back at this season of the year. See this calendar for February for suggestions as to control.

If you have any areas on your farm, especially low, wet places, and also have had lungworm disease, fluke disease, or similar troubles in livestock on that area, keep your animals off that land for a year or two if possible. If these areas must be used, use them for mature animals of a different species. Keep your young livestock away from such places.

The cost of patent worm remedies for a period of years is usually much greater than a veterinarian's fee for sound advice as to treatment and prevention.

SEPTEMBER

Dip livestock for lice, ticks, and mange mites while weather is still warm.

Obtain bulletins which tell how to combat these pests.

Now is the time to dip your livestock for lice (fig. 15), sheep ticks, true ticks, and mange. Later it will be too cold to do more than apply palliative measures to keep down these pests. Do it now while the weather is still warm and save yourself trouble later, as these pests are more troublesome in cold weather. Consult Farmers' Bulletins Nos. 1330 (*8*) (sheep parasites), 1493 (*17*) (lice, mange, and

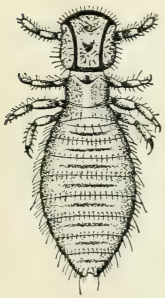

FIG. 15.—Biting sheep louse, female, enlarged

FIG. 16.—Two pigs of the same age. The large one is normal; the other was stunted by worms and other hog-lot infections

ticks of horses), 1085 (*16*) (hog lice and hog mange), 1017 (*15*) (cattle scab), 980 (*14*) (ear ticks), 909 (*13*) (cattle lice), 798 (*12*) (sheep ticks), and 713 (*11*) (sheep scab). Clean up lice on poultry. See Farmers' Bulletins Nos. 1337 (*7*) and 801 (*6*).

In your fall farrowing of pigs plan to use the swine-sanitation system as modified for farrowing on pasture in the fall. Note the contrast as shown in Figure 16 between a healthy pig and one stunted by parasites. Consult United States Department of Agriculture Leaflet No. 5 (*18*).

A mud wallow for pigs provides a breeding ground for worm eggs and helps to load pigs with roundworms and kidney worms. At one packing plant in the South kidney worms and thornheaded worms cause an annual loss of $80,000. The use of a concrete wallow is an aid in keeping down worm infestations, provided it is properly constructed and used. See Farmers' Bulletin No. 1085 (*16*) for directions for constructing and using concrete wallows.

In regions where parasites interfere with sheep raising, breed ewes in time to lamb early, if you have the equipment, and market before the worms share your profits. Early lambs come before the parasites wake up from their winter sleep.

OCTOBER

Last call of season for dipping livestock.
Learn about trichinosis and reasons for cooking pork well.

Did you dip your livestock last month? If not, do it now, before cold weather. If sheep scab is dormant in your flock it will make trouble later. Consult Farmers' Bulletin No. 713 (*11*). Clean up chicken lice.

Beware of trichinosis. Now is the time for early fall slaughtering of pigs. Every year pigs are killed on the farm and made into sausage and other products. Every year the incautious farmer's wife tastes the raw sausage to see whether the seasoning is right and the farmer's family or friends eat some of the sausage or other pork products raw. And every year there are a number of deaths from trichinosis as a result of this proceeding. The disease is caused by very small worms known as trichinae. (Fig. 17.)

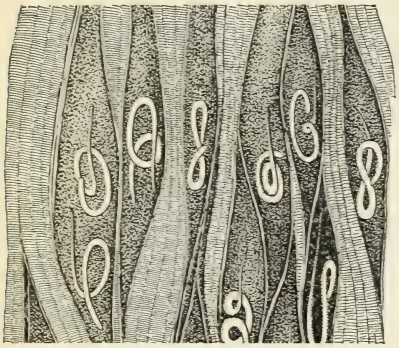

FIG. 17.—A magnified portion of raw pork infested with trichinae

Most of our trichinosis arises from farm slaughtering of pigs and the eating of raw sausage from small, uninspected establishments. Trichinosis appears to cause swine very little trouble or discomfort, but it is a very painful disease in man and is frequently fatal. There is no dependable cure or treatment. Cook pork and pork products well and thoroughly, and avoid eating them raw.

When nature supplies your chickens and turkeys with "free" feed in the form of earthworms, snails, slugs, and insects, there may be a cost to reckon with later. Many parasitic worms use these other small animals as intermediate hosts or as carriers of some sort in getting from one bird to another. Thus earthworms sometimes transmit gapeworms to chicks; slugs and snails transmit tapeworms and nematodes (the roundworm group) to chickens and turkeys. These small animals swallow worm eggs in the droppings or in contaminated soil, and carry the eggs or young worms to the bird that eats the earthworm, slug, snail, or insect. It is sometimes necessary to combat these intermediate hosts in order to control certain parasitic worms. The Bureau of Animal Industry will identify parasitic worms and furnish any available information in regard to life histories and control measures. Many life histories are not yet known, and control measures must await the results of scientific investigations such as those on which our known effective control measures are based.

NOVEMBER

Control worms in chickens.
Take continued precautions against trichinosis.
Make certain that houses to be occupied by livestock during winter are clean, well drained, and well ventilated.

If your chickens have worms (fig. 18), as revealed by a postmortem examination of one or several of them, use 2 per cent by weight of finely powdered tobacco dust, containing at least 1.5 per cent nicotine, in the dry mash to control roundworms and cecum worms in the flock and thus diminish the danger to young chicks

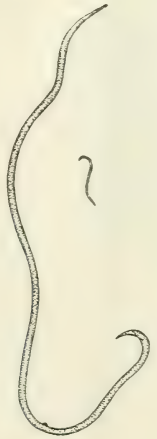

FIG. 18.—The large roundworm of the small intestine of the chicken, and the small cecum worm. Natural size

and poults next spring. The cecum worm carries blackhead. Consult Farmers' Bulletin No. 1330 (*8*).

Beware of raw or inadequately cooked pork products! Read the calendar for last month and continue to take precautions to protect yourself and your family against trichinosis.

November is an excellent month for putting all buildings that are to be occupied by livestock in good condition for the winter. Give special attention to cleanliness, drainage, and ventilation.

Manure is the greatest source of danger from the eggs and young of parasitic worms and the cysts of coccidia. Old and well-rotted manure may be regarded as safe so far as these parasites are concerned, and fresh manure must be regarded as dangerous. If manure is kept until well rotted, it should be under conditions which prevent fly breeding. If it is spread on the field while still fresh it should be plowed under promptly.

DECEMBER

Treat horses for bots.
Strive to keep livestock comfortable, thereby favoring more profitable production.

Lice and mange (scab or scabies) (figs. 19 and 20) are commonly prevalent in December. If you didn't dip last fall, use such palliative

FIG. 19.—An advanced case of sheep scab

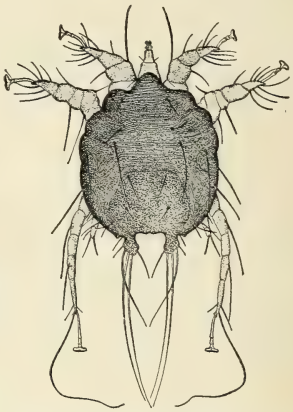

FIG. 20.—Sheep-scab mite, the parasite that causes common scab. Enlarged

measures as are possible at this season of the year and be sure to dip next fall.

Now that the adult botfly has ceased to fly, except in parts of the South, call in your veterinarian and have him treat your horses for bots with carbon bisulphide. Treat the bot eggs with a 2 per cent coal-tar-creosote solution or shave them off with a safety razor. Bots (fig. 21) interfere with a horse's nutrition and in heavy infestation may even cause death. One of the bots, the nose botfly, is exceedingly troublesome as an adult fly, as horses are badly frightened by it and may run away, sometimes with serious consequences. Write for Farmers' Bulletin No. 1503 (*4*).

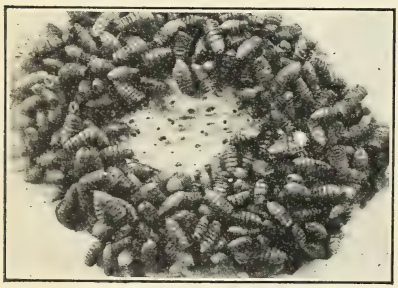

FIG. 21.—Bots on a portion of a horse's stomach. Note holes in stomach lining

Ox warbles may be present in some parts of the South in December. See directions for February.

YEAR-ROUND PARASITE PRECAUTIONS

Permanent pastures perpetuate parasites! Change your stock from one pasture to another, and change the kind of stock on the same pasture as far as possible. Follow sheep and cattle with horses or swine.

Don't overstock. Overstocking concentrates pasture infection, resulting in more worm eggs and young worms to an area, and increases the chances of stock picking up the infection.

Use the swine-sanitation system in raising pigs. It will put money in your pocket and build up your bank account.

Put your young livestock on clean and safe areas away from older animals other than the mothers and away from areas which have been occupied by the older animals. Older animals carry parasites and diseases, and the areas occupied by them are infected. Young animals are more susceptible to trouble from these causes. Give the young animals special care and attention, as you would a baby. Most of the losses among livestock occur in young animals.

If animals are unthrifty, the trouble is probably poor breeding, poor feeding, or parasites. If it isn't the first two, suspect parasites of being the cause.

Chickens and turkeys are a bad mixture. Turkeys convey gapeworms to chickens, and chickens convey blackhead to turkeys. Raise one or the other, but not both unless you can keep them well separated.

Preventing trouble by sanitation and good farm practice is the business of the farmer. When disease is actually present it is advisable to call in a competent veterinarian and to do it early, before losses occur. It is better to sacrifice a sick lamb or chicken to find out the cause of trouble than to lose a large part of the flock.

Quarantine all new stock brought on to the place to be sure you are not introducing parasites and disease.

Burn or bury carcasses to prevent the breeding of screw worms and the transmission of dangerous parasites directly or as a result of dogs' eating the carcasses and spreading infection.

Drain or fill in the wet areas on your farm. Such places breed parasites.

Keep your dogs free from parasites, as some of the parasites that infest them are transmitted to man and livestock.

Spread manure frequently and plow it in. Don't keep it around to breed flies. In the spring, plow your old straw stacks and loose straw under, or burn them; they breed stable flies.

In the South parasites are likely to be prevalent throughout the year or to occur earlier in the year than in the North.

Send any unusual parasites to the Department of Agriculture for identification and write for advice.

Clean up your yards, corrals, stables, and all small inclosures every spring and fall, and keep the entire premises in reasonably clean and sanitary condition at all times. Parasitic diseases and other diseases flourish in dirty places. Cleanliness is profitable to the farmer and stockman.

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